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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

DOUG LITTLE, Chairman
BOB STUMP
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TOM FORESE
ANDY TOBIN

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN.	DOCKET NO. E-01345A-16-0036 **ARIZONA PUBLIC SERVICE COMPANY'S NOTICE OF FILING SUPPLEMENTAL TESTIMONY**
IN THE MATTER OF FUEL AND PURCHASED POWER PROCUREMENT AUDITS FOR ARIZONA PUBLIC SERVICE COMPANY.	DOCKET NO. E-01345A-16-0123

Attached please find the supplemental direct testimony of Jeffrey Burke and Charles Miessner. This testimony is filed consistent with the ACC decision made on December 20, 2016 in the Value and Cost of Distributed Generation Docket No. E-00000J-14-0023.

RESPECTFULLY SUBMITTED this 30th day of December 2016.

By: Melissa M. Krueger

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B. M

SUPPLEMENTAL DIRECT TESTIMONY OF JEFFREY M. BURKE

On Behalf of Arizona Public Service Company

Docket No. E-01345A-16-0036 and E-01345A-16-0123

December 30, 2016

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SUPPLEMENTAL DIRECT TESTIMONY OF JEFFERY M. BURKE
ON BEHALF OF ARIZONA PUBLIC SERVICE COMPANY
(Docket No. E-01345A-16-0036 and E-01345A-16-0123)

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.

A. My name is Jeffrey M. Burke. I am the Manager of Resource Planning for Arizona Public Service Company. My business address is 400 N. 5th Street, Phoenix, Arizona 85004. I joined APS in 2014 in my current role.

Q. WHAT ARE YOUR RESPONSIBILITIES AT APS?

A. I manage APS's Integrated Resource Planning efforts through which APS plans and develops resources to meet the future electricity needs of its customers.

Q. WHY ARE YOU TESTIFYING REGARDING RESOURCE PLANNING, INSTEAD OF JAMES WILDE, THE APS WITNESS WHO SUBMITTED DIRECT TESTIMONY ON RESOURCE PLANNING TOPICS WITH THE ORIGINAL APPLICATION?

A. In the normal course of business, Mr. Wilde transferred positions in the Company, and is no longer part of the APS Resource Planning Department. I previously reported to Mr. Wilde. In that role, I assisted him with the preparation of his Direct Testimony and am intimately familiar with its contents. Going forward in this proceeding, I will be APS's Resource Planning witness. I will adopt Mr. Wilde's Direct Testimony as my own; and will be filing any Rebuttal Testimony regarding Resource Planning issues on February 17, 2017; and will appear at the hearing to testify regarding issues related to Resource Planning.

Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY?

A. As part of its December 20, 2016 decision in The Value and Cost of Distributed Generation, Docket No. E-00000J-14-0023, the Commission ordered that in pending rate cases (such as this one), the amount paid for energy exported by rooftop solar be set by a Resource Comparison Proxy Methodology (RCP). The Commission also provided that for pending rate cases for which a hearing had been set, but not yet conducted, the calculation and implementation of the RCP should be incorporated into the existing proceeding in a manner determined by the Presiding Officer. This Supplemental Direct Testimony is intended to facilitate that incorporation.

II. SUMMARY OF TESTIMONY

Q. PLEASE PROVIDE A BRIEF SUMMARY OF YOUR TESTIMONY.

In my testimony, I explain the assumptions that APS made in calculating the value of solar using the RCP spreadsheet developed as part of the proceedings in Docket No. E-00000J-14-0023. I also discuss the RCP value that these assumptions produce, and explain that this dollar per kWh value constitutes APS's proposed application of the approved methodology for how to compensate customers who submit an interconnection application for rooftop solar, after the effective date of a decision in this rate case, for energy they export to the grid.

III. BACKGROUND REGARDING THE RCP CALCULATION

Q. WHAT IS THE RCP?

A. The RCP involves calculating a dollar per kilowatt hour (kWh) "value of solar" for energy exported to the grid by rooftop solar systems. This value is established using the cost of all grid-scale solar photovoltaic facilities that have gone into service in the last five years as a proxy. Because the group of grid-scale facilities might involve both third-party and utility-owned projects, this cost includes both the price established in power purchase agreements (PPAs) for third-party owned facilities, and the cost to build for utility-owned projects (calculated by the total revenue requirement divided by kWh production).

Q. PLEASE EXPLAIN HOW THE RCP IS CALCULATED.

A. The calculation of the RCP is reflected in a spreadsheet that was developed as part of the proceedings in Docket No. E-00000J-14-0023. A sample of that spreadsheet reflecting APS's final calculations and proposal for this proceeding is attached to this testimony as Attachment JMB-1DR, which is marked Highly Confidential. For APS, the spreadsheet is populated with up-to-date information regarding APS's solar photovoltaic PPA prices for all the third-party owned projects that supply their energy to APS; the costs for each of the grid-scale facilities that APS owns; and the energy produced by both types of facilities in their first full year of operation. The spreadsheet also includes several "levers" that can be toggled. These levers are essentially assumptions that can be made in calculating the RCP that can influence the final value established through the RCP.

Q. WHAT ASSUMPTIONS MUST BE MADE TO CALCULATE THE RCP USING THE SPREADSHEET?

To calculate the RCP with the spreadsheet, one must decide: (i) the base year from which the RCP is calculated; (ii) the number of years going back from the base year the RCP should include; (iii) whether to use an RFP or in-service date for the grid-scale facilities included in the spreadsheet; (iv) whether to include the Arizona Production Tax Credit when calculating the cost of utility-owned facilities; (v) whether to provide equal weight across all years, or reduce the weight given to older, more expensive projects; and (vi) whether to levelize the cost of the grid-scale facilities.

Attachment JMB-2DR is an excerpt from the transcript in Docket No. E-00000J-14-0023 that includes testimony from APS witness Brad Albert explaining the RCP spreadsheet and how the various assumptions function. I incorporate by reference Mr. Albert's explanation as if I provided that same explanation here.

Q. PLEASE DESCRIBE THE GRID-SCALE ADJUSTMENT.

A. The RCP spreadsheet (Attachment JMB-1DR) includes the option of applying a "grid-scale adjustment," which is a calculation that captures the operational differences between rooftop and grid-scale solar facilities. The original grid-scale adjustment included adjustments for (i) the superior capacity value and production profiles of grid-scale facilities, as it relates to performance during peak customer demand periods or higher value times; (ii) the ability to curtail grid-scale production so that APS customers can receive the benefit of negatively-priced power; and (iii) the difference in energy losses experienced between DG and grid-scale facilities. The grid-scale adjustment can be positive or negative, and will adjust the aggregate value up or down by the indicated percentage.

Q. DID THE COMMISSION'S DECISION IN DOCKET NO. E-00000J-14-0023 CHANGE HOW THE GRID-SCALE ADJUSTMENT IS TO BE CALCULATED?

A. Yes. There are three aspects of the grid-scale adjustment require making affirmative choices—capacity value, curtailability, and timing of energy delivery. But the Commission has already decided to include the energy losses in the RCP calculation. The Commission also decided to credit DG for any distribution or transmission capacity that rooftop solar permits APS to avoid.

IV. <u>HOW APS CALCULATED THE RCP</u>

Q. PLEASE EXPLAIN THE ASSUMPTIONS THAT APS MADE IN CALCULATING THE RCP.

A. For this proceeding, APS calculated the RCP using the following assumptions:

(i) 2015 as the base year;[1]

(ii) the full 5 years;

(iii) the in-service date;

(iv) including the Arizona Production Tax Credit because that credit actually applies to reduce costs to customers today and including it reflects actual conditions;

(v) equal weighting across the five years; and

(vi) levelizing the costs of both third-party and APS-owned facilities.

These assumptions are conservative and reflect a balanced approach that was considered during Docket No. E-00000J-14-0023. Collectively, this set of assumptions cause the RCP to be higher than it might otherwise be. If one or more of these assumptions is modified, the balance would be upset and it might be appropriate to revisit other assumptions.

[1] Although APS proposes to use 2015 as the base year, the RCP is designed to incorporate different years as it is updated annually in the future.

Q. WHAT ENERGY LOSSES CREDIT DID APS USE?

A. APS conducted a line loss study in this pending rate case as part of its Cost of Service Study. In calculating the losses credit, APS included four categories of losses: (1) distribution transformer losses, (2) distribution feeder line losses, (3) distribution substation transformer losses, and (4) 69 kV transmission line losses from the study. APS excluded two entire categories and one partial category found in the line loss study in determining this credit. First, APS excluded the losses through the service drop and service entrance because APS would continue to incur those losses as rooftop solar customers export their energy back to the grid. Second, APS excluded high voltage losses, including the step-up transformer loss at plant, 500 kV transmission loss, 500/230 kV step-down transformer losses, and the 230 kV transmission loss categories, because APS does not take delivery from any grid-scale photovoltaic facility at a voltage higher than 69kV. Finally, the line loss study included with APS's COSS grouped 230/69 kV transformer losses with 69 kV losses. Because APS does not take service from any grid-scale solar photovoltaic facility above 69 kV, here APS separated the 230/69kV transformer losses from the 69 kV transmission line losses and only included the average 69 kV losses. Taking out the higher, more efficient, transmission lines result in an average loss figure of 3.72%. By contrast, the average losses for voltages of 69 kV and higher as stated in APS's Open Access Transmission Tariff on file with the Federal Energy Regulatory Commission are 2.5%. APS used the 3.72% figure to calculate the losses credit for the RCP.

Q. PLEASE DESCRIBE APS'S CALCULATION FOR THE DISTRIBUTION AND TRANSMISSION CAPACITY CREDIT.

A. The Commission's decision in Docket No. E-00000J-14-0023 did not specify how to calculate the distribution and transmission capacity credits. Because the Commission rejected long-term forecasts as speculative and distinguished the RCP from the 5-year Avoided Cost Methodology that has yet to be developed, it can only be assumed that the Commission intended traditional ratemaking principles to apply. As a result, APS witness Charles Miessner performed this calculation based on system-wide data showing that in 2015 only 8 MWs of residential rooftop solar energy were being exported to the grid at the time of APS's system peak. As described in Mr. Miessner's Supplemental Direct Testimony, based on this data and APS's COSS, the transmission and distribution credit for rooftop solar should be 0%.

Q. DID APS INCLUDE ANY OTHER COMPONENTS OF THE GRID-SCALE ADJUSTMENT?

A. No. The Commission's order did not affirmatively decide whether to include or exclude the capacity value, curtailability, and timing of energy delivery aspects of the grid-scale adjustment. APS does not propose to include those adjustments in this proceeding, but may do so in future rate cases.

Q. DID APS EXEMPT ANY GRID-SCALE SOLAR FACILITIES CONTAINING BATTERIES, OR FACILITIES PRIMARILY USED FOR RESEARCH AND DEVELOPMENT PURPOSES?

A. No, APS does not own or purchase energy from any grid-scale facility that falls in either category.

Q. WHAT IS THE FINAL VALUE DERIVED FROM APS'S RCP CALCULATION?

A. Using the assumptions and credits described above, APS arrived at an RCP value of $0.11524/kWh. APS proposes that this be the amount APS pays to non-grandfathered rooftop solar customers for the energy they export to the grid.

Q. WHY IS THIS AMOUNT DIFFERENT FROM THE 10.9 CENTS PER KWH IDENTIFIED IN DOCKET NO. E-00000J-14-0023?

A. APS initially calculated the RCP as $0.109/kWh in Docket No. E-00000J-14-0023. Subsequently, however, APS updated the data in the RCP spreadsheet to reflect updated revenue requirement information. As a result, the RCP rose to approximately $0.111/kWh. Multiplying this 11 cent RCP by the losses credit of 3.72% results in a final RCP of $0.11524/kWh.

V. CONCLUSION

Q. WHAT ABOUT THE AVOIDED COST METHODOLOGY THAT THE COMMISSION ALSO APPROVED IN DOCKET NO. E-00000J-14-0023?

A. Although the Commission also approved a separate, five-year Avoided Cost Methodology, it ordered that the RCP alone be used for pending rate cases. The Commission ordered that the Avoided Cost Methodology be developed with Commission Staff for use in subsequent rate cases. The Commission stated that in future rate cases, it will use the RCP, the Avoided Cost Methodology, or some combination of both to set the "value of solar."

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes.

ARIZONA PUBLIC SERVICE COMPANY
RESOURCE COMPARISON PROXY CALCULATION

Base Year	2015
Years	5
RFP/In-Service	In-Service
AZ PTC	Yes
Yearly Weight	No
PPA Levelized/Yearly Cost	Levelized
Utility Owned Levelized/Yearly Cost	Levelized
Grid Scale Adjustment	-3.72%

Year	Project #	Projects	Highly Confidential Cost per MWh	1st Year Energy	Weight	Weighted Energy	Highly Confidential Weighted Cost (1,000's)
	1	Desert Star	[redacted]	36	100%	35.6	[redacted]
	2	Luke AFB		35	100%	34.9	
2015	3						
	4						
	5						
	1	Gila Bend		108	100%	108.4	
	2						
2014	3						
	4						
	5						
	1	Hyder 2		46	100%	45.9	
	2	Foothills		112	100%	112.0	
2013	3	Gillespie (PPA)		45	100%	44.7	
	4	Badger (PPA)		40	100%	40.1	
	5						
	1	Saddle Mountain (PPA)		39	100%	39.3	
	2	Hyder		42	100%	41.7	
2012	3	Chino Valley		49	100%	49.5	
	4						
	5						
	1	Paloma		43	100%	42.8	
	2	Cotton Center		46	100%	46.2	
2011	3	Ajo (PPA)		10	100%	10.4	
	4	Prescott (PPA)		26	100%	25.7	
	5	Bagdad (PPA)		35	100%	35.0	

Weighted Cost	$79,106.96
Energy	712.0
Average Cost per MWh	$111.10
Grid Scale Adjustment	-3.72%
Adjusted Cost per MWh	**$115.24**

MR. ALBERT: Good morning.
MR. LOQUVAM: Thank you, Your Honor.

BRADLEY J. ALBERT,

recalled as a witness on behalf of APS, having been first duly sworn by the Certified Reporter to speak the truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. LOQUVAM:
Q. Is Staff-5 up there, Mr. Albert?
A. I have all of the original data requests in my binder so I think I have got everything.
Q. Okay. Do we want to use the precise -- we should use the same exhibit so we are speaking from the same document.
MS. SCOTT: Your Honor, can I approach?
ACALJ JIBILIAN: Yes.
BY MR. LOQUVAM:
Q. Can you identify S-5 for the record?
A. S-5 contains copies of our data request responses to the Staff's third set of data requests to us.
Q. And this is the public version, correct?

A. Correct.
Q. And then S-6?
A. Oh, I am sorry. Staff-5 also includes the public version of our responses to Staff's fourth set of data requests also.
Q. Thank you. And then can you describe S-6 to me.
A. S-6 contains all of the confidential and highly confidential portions of our responses to Staff's Data Requests Set No. 3 and Set No. 4.
Q. Great. If you could move the mike a little closer, too, that would be good.
A. Thank you.
Q. So what I would like to do, Mr. Albert, is walk through just so, to provide an explanation of what these data requests are so they can be admitted into evidence. And so can you describe APS's response to 3.1 at a high level?
A. Yes. Data Request 3.1 requested information on all of the solar PPAs that APS has entered into. And the type of information was the effective date, i.e., when that specific generating project started producing energy for us, what the term of the PPA was, the pricing information related to the PPA, the type of renewable technology, and it also requested copies of each of the actual contracts, the actual purchase power agreements

themselves.

Q. And then 3.2?

A. Data Request 3.2, just to summarize, requested the same type of information but now for solar projects that APS owned rather than purchased via long-term PPAs.

Q. Okay. 3.3, 3.4, and 3.5 are mostly text and speak for themselves, so I won't ask you necessarily about that. But I would like to focus on 3.6. And 3.6 has a confidential spreadsheet that I want to talk about in a moment. But at a high level, can you sort of orient, before we get to the spreadsheet, what APS's response in 3.6 was conveying?

A. So the request that we were responding to requested us to build a spreadsheet that had the ability to combine the cost and pricing information for all of those solar projects, the solar PV projects, into a spreadsheet that could then calculate a weighted average overall price or cost for all of those solar projects. And we also had a number of switches, dials of variance that we put on, for instance, how far back did you want to go in terms of looking at what projects were placed in service to include in that averaging calculation, did you want to use levelized cost information for the life of the project or current price information in the year chosen, those type of variables.

Q. So is it correct to say that at a high level, the 3.6 provides a per kilowatt hour amount that blends all of APS's grid scale facilities that are actually installed?

A. Correct, with one -- I would just refine the answer a little bit to say that this was specific to grid scale renewable solar photovoltaic projects.

Q. And then recognizing that this is -- numbers are not necessarily all that simple, what romanettes i through vi provide are different, what you described as, levers or sort of factors that could be adjusted from a policy perspective to change how the number is viewed, is that right?

A. Correct.

Q. Okay. So attached to 3.6 is a confidential spreadsheet, APS15913. It, actually, it is highly confidential. And because it is highly confidential I don't want to get into any numbers that are specific unless we absolutely have to because we will have to close the hearing room. But do you have that spreadsheet in front of you?

A. I do.

Q. And that spreadsheet is a summary of, at least page 1 of 19 is a summary of what you were describing, is that right?

A. Correct.

Q. And then pages 2 through 19 of that Excel spreadsheet are some of the data backup for this spreadsheet, is that right?

A. That's right. That's all of the project-by-project specific information that is used to derive the amount of energy produced for each project as well as the price or cost information.

Q. And APS provided this in Excel spreadsheet that was active with the formula to each party, is that right?

A. Correct. And if you were to look in the upper left-hand corner of that first page of 15913, active in this sense means that any of those variables in the upper left, the box in the upper left-hand corner, can be toggled or modified to create a different result.

Q. Okay. And definitely I want to get there. Let's get into the spreadsheet itself.

There is, the year is the first column, and then projects for each year. Are those the projects that were installed those years?

A. For instance, if you look on the result down below, and I will just point out that there is no necessary order or priority in terms of how those switches are set in the version that we gave, but if you look, for instance, in 2011, you see five specific projects that show up in those years, in that year. Those five projects were placed into service in 2011.

Q. And then the next, sticking with the 2011 year, the next column is highly confidential. And it just describes the cost per megawatt hour from either the revenue requirement calculation or the PPA itself, is that right?

A. Correct.

Q. And then the next, can you describe what first year energy means in that next column?

A. So that is the amount of energy that that project was expected to produce in its first year of operation. And with solar photovoltaic projects, and in particular there is some expected degradation in the performance of the solar panels over time, so you would expect that as time goes on that there would be less production net coming out of each one of those facilities.

Q. Now, I see on the first one Paloma. And this number is not highly confidential. It says simply 42. 42 what?

A. That is 42 gigawatt hours of energy, which would be the same thing as saying 42,000 megawatt hours of energy or 42 million kilowatt hours of energy.

Q. Okay. And was that actual production in 2011?
A. Yes, it was.
Q. And, for instance, line 3, Ajo, there is only 10 gigawatt hours. Is that because Ajo was placed later in service in 2011?
A. In this -- that could be the case in some of these projects. Ajo, for instance, is a much smaller project in terms of overall size than Paloma is, for instance. So without -- I could look at the details, but without knowing the actual in-service dates, it could be both of those factors.
Q. Okay. And, you know, we described actual -- are all of the numbers in the first year energy for each of the years here actual numbers?
A. Correct.
Q. And then for any number, of course, in 2016, in the detail underlying this spreadsheet, it would all be forecasted numbers, is that right?
A. Correct.
Q. And so by -- so when you describe how Ajo had a smaller amount of production, you indicated that could either, and other projects have varying levels of size, that could either be because they are smaller projects or in that first year were not placed, did not have a full year of service, is that right?

A. It could be either.

Q. Okay. On the next column it says weight, 100 percent. What is that column?

A. That is a weighting factor that relates to one of those levers, as you described it, in the upper left-hand corner, which allows you to, and I am referring to the one titled yearly weight, it allows you to, in this spreadsheet, to weight projects that are, were placed in service further back in time less than projects that were placed closer to today under the theory that projects that were placed in service, for instance, in 2015 are more relevant or closer to current market conditions than projects placed in service, for instance, five years ago. So you have the ability in this spreadsheet to weight those projects less.

Q. So, in other words, the weighting here causes whatever number eventually comes out; if you weight later projects less, you are trying to account for the fact that prices have declined and the actual costs that APS customers are paying has also declined?

A. Correct.

Q. And then the next category is weighted energy. And is that just simply the multiplication of the first year energy and the weight?

A. That's correct.

Q. And so by having a weighted energy column, that effectively not only weights the time but also weights the size of the project, is that right?

A. Yes. It allows you, in the spreadsheet, to weight something in 2011, for instance, at a lower overall weighting from a time perspective. But also it would be weighted by that amount of energy that it produces. So a larger project in 2011 that produces more energy would have a higher weighting or a higher impact on the overall calculation than one that produces less energy.

Q. And then that last column is highly confidential and it has weighted cost. And can you describe conceptually what that column shows?

A. So that would, that would just be the combination of multiplying out the cost per megawatt hour, that highly confidential cost per megawatt hour times the amount of energy, or weighted amount of energy, to arrive at a weighted cost. And the numbers presented there are in thousands of dollars. So, for instance, so -- well, we can't go any further with that answer, giving an example.

Q. Yeah. So then at the bottom there is a little box. And I am going to get to the levers in a minute, but I would like to get all the way through the little box. It has weighted cost. Is that just simply the addition of all the weighted cost column numbers?

A. In that last column, that's the addition of that last column.

Q. Okay. And then the energy is the addition of all the weighted energy --

A. Correct.

Q. -- numbers? And then the average cost per megawatt hour, the next line down, is just simply division there?

A. It is the division of those first two that you just mentioned.

Q. Okay. And if we are just to stop there, that would just be a very simple weighting using both time and the size of all grid scale projects to come up with a blended or aggregate kilowatt hour number, is that right?

A. Correct.

Q. Now, I see it says $111.27. That's actually a megawatt hour number, is that right?

A. That would be $111 per megawatt hour.

Q. And what is that in kilowatt hours?

A. It would be the equivalent of 11.1 cents per kilowatt hour.

Q. Okay. And then the next line, it says grid scale adjustment. Can you describe that line?

A. I would certainly like to. And I would probably refer back to my direct and rebuttal testimony in this proceeding, that one of the three methodologies that I presented was what was what I refer to as a grid scale adjusted methodology. And that adjustment is really what is reflected by that 20 percent number there. And it really reflects five factors that are related to an adjustment between the value that a grid scale solar PV system could bring as compared to the export portion of a rooftop solar system.

And those factors that were discussed in my testimony before, probably the largest one of them is generation capacity value, i.e. that a grid scale system performs better at the time when our customers need energy the most, i.e. our peak demand period, than the export portion of rooftop solar. The other factors that we recognized in that 20 percent adjustment included energy losses; impacts on transmission infrastructure, which is a relatively small one per our analysis; as well as the value of the energy, i.e. that a grid scale system that produces better at the times when demand, customer demand, is higher has a higher energy value than the export portion of rooftop solar; and also the value of curtailibility, the ability to curtail a grid scale system in response to, for instance, negative wholesale power prices. Those were the five factors that went into that 20 percent adjustment.

Q. And I notice that the 20 percent adjustment adjusts the average cost per megawatt hour down. Can you describe why it adjusts it downward?

A. So the net of those five factors that I just mentioned result in a grid scale system, that we have got those grid scale systems having a 20 percent higher value than the export portion of the rooftop solar.

Q. And so the 89.02 cents adjusted cost per megawatt hour, which would be 89.9 cents per kilowatt hour, is what could be conceptually applied to exported rooftop solar energy if you were to accept these assumptions in this spreadsheet, is that right?

A. Correct. If you were to accept this as the way of deriving that, yeah.

Q. So we are almost done. I want to talk now about the levels up on the top left. It is base year. And this goes along with the assumptions that I just referenced.

So the base year 2015, what does that mean?

A. That means it is factoring in projects that were in service in 2015 or before.

Q. Okay. And on the live spreadsheet, this number and all of the other numbers in this red box can be toggled, is that right?

A. Correct. The, I guess it is red, I don't know what the color is on my copy here, but the box that's in the upper left-hand corner of this particular sheet, all of those can be toggled.

Q. Okay. And so what would happen if you were to toggle base year to something different?

A. So, for instance, I can't say that I have run every potential combination of these, but a couple of them, you know, holding other things equivalent, for instance, that the difference between having, you know, going back five years versus going back three years makes a fairly substantial difference, and probably on the order of, you know, 10 percent or more in terms of lowering the value by 10 percent.

Q. Well, no, that -- isn't the next line the years five?

A. Oh, I am sorry. Maybe I misunderstood your question.

Q. So is there a toggle for base year 2015?

A. Yes. You could make that base year, for instance, 2014 --

Q. Okay.

A. -- if you wanted to.

Q. And what would happen if you made it 2014?
A. What would happen is those projects that went in service in 2015 would not be part of the calculation. And it would only include the projects that went in service in 2015, excuse me, 2014 and before.
Q. And if you made that base year 2016, it would start incorporating forecasted energy production rather than actual?
A. Correct. But it would also, if you made that base year 2016, and left the one below it as five years, you would incorporate any projects that came into service in 2016, but you would also drop out of the calculation the projects that went into service in 2011.
Q. Okay. And on the next line, the years, it says currently five. And if I recall correctly, it can be toggled to either three or five, is that right?
A. You can actually toggle anything. You can make it one if you wanted to.
Q. Okay. And right now it is set at five. And that's essentially all of APS's grid scale projects, is that right?
A. We don't have any grid scale projects that went in service in 2010. The first ones are what you are seeing as going in service in 2011.
Q. Okay. And if it moved from five years to three

years, it would drop off the grid scale projects that went into service in 2011 and 2012. And that would, and since those projects were earlier and costs were higher, that would have the effect of reducing the average cost per megawatt hour, is that right?

A. Correct.

Q. Okay. And then the next says RFP or in service. Can you describe what that toggle is?

A. So the thinking behind that one was that the cost of these projects could be related more towards the timing of when we issued an RFP for them and actually went through the procurement process, because that's when the suppliers are costing out all of the various inputs like solar modules that go into a project. So you have the option with that toggle to select either the date that we did the RFP and actually signed the contract versus the date that the project was actually put in service.

Q. In your opinion, do you believe one is more relevant than the other?

A. I think this one you could do either way, but the logic for it being there was that we thought that the RFP timing was more relevant to the cost incurred for the project.

Q. Okay. The next line is AZ PTC. Can you describe what that toggle is?

A. So Arizona has a production tax credit that was passed back in, I think, either 2010 or 2011, which provides a graduated 10-year production tax credit for solar projects like this that were placed in service in this intervening time frame. A number of projects actually qualify for that production tax credit. Some of our ownership projects do as well as some of the PPA projects that we have.

It is a 10-year tax credit. It only applies to the first 10 years that the project is in service. And the overall amount of the tax credit, the overall pool of dollars is limited to, I think, $20 million a year of tax credit for Arizona. So it is, the tax credit is parceled out on a first-come/first-serve basis.

Q. Then currently APS's customers are receiving the benefit of the PTC, is that right?

A. Correct. For the owned projects that we have that qualify for the Arizona PTC, the impact or the cost reduction associated with that PTC is reflected as a reduction in our revenue requirements.

Q. And if this would be toggled to no, that would remove the effect of the PTC and the revenue requirement for APS owned projects would go up, is that right?

A. Correct.

Q. And that would make the average cost per megawatt hour number go up as well?

A. That's correct, also. And I would say that it is just a handful of our projects that qualify for it because of the first-come/first-serve nature of it. So it is not an across-the-board increase on every project. It is just selected ones.

Q. And then the next toggle, yearly weight, can you describe that?

A. And I think we had that discussion a little bit before, that this toggle would allow you to apply a higher weight in the calculation to projects that were placed in service more recently than projects that were placed in service, say, for instance, in 2011. And I think we did it in a linear way.

Right now that's toggled, in this example that I am looking at, with no rhyme or reason, it is toggled to no. So you see the weight column, which is the third over from the right-hand side of this spreadsheet, they are all set at 100 percent. So they are all equally weighted. A project five years ago is equally weighted to a project that was placed in service in 2015 the way this is set up right now.

Q. Okay. And then the next toggle, PPA levelized/yearly cost?

A. Yes. So our PPA projects actually have, some of them are just priced in a levelized way, i.e. the same energy price for every year of the duration of the project. Some of them also have a starting price that escalates with a known escalator over time. And, therefore, we could levelize them -- levelizing is a form of averaging them -- or use the annual values in this calculation. And right now that toggle is set to levelize. So what you are seeing there in the confidential version is the average or levelized price over the length, over the whole life of the contract.

Q. And if it was set to yearly, it would just simply -- if the PPA had an escalator clause, that would increase over time as the escalator clause was applied?

A. That would apply to the levelized. But if it was set to yearly, it would just be whatever that current base year was, what the price was in that year.

Q. Okay. I am sorry. Because if the next year showed a 3 percent escalation, then that next year would be 3 percent higher?

A. Correct.

Q. But if it was levelized, both years would be the same number, in fact, every year would be the same number for this PPA calculation?

A. That's the right interpretation, correct.

Q. And then the utility and levelized/yearly cost toggle?

A. Very much the same concept but a little differently, because utility owned projects, the revenue requirement is higher at the beginning, at the beginning of the life of the project and declines over time as the project is depreciated, less rate base as it is depreciated, so, but, again, same concept. You can either collect the current revenue requirement, in this case for 2015, to base the calculation on or you can do a levelized, using a levelized number that reflects the levelized over the life of the project.

Q. And then we discussed the final grid scale adjustment, that you can just toggle that on or off or you can change the percentage, is that right?

A. Correct. You could put any percentage in that you would like.

Q. Real quickly, back on the PPA levelized or yearly, if you were to toggle this to yearly, would that increase or decrease the average cost per megawatt hour?

A. If you were to toggle the PPA levelized/yearly to an annual number, it would have the effect of decreasing it, because the PPAs that have an escalation factor will continue to go up in price over the life of the contract.

Q. And same question for the utility owned levelized versus yearly.

A. So since, since -- and that would be probably the exact opposite of what I just described. So if we were to use a levelized version at this point in the life of all these projects, the levelized is likely to be lower than the yearly version because we are relatively near to the project's in-service date, so the revenue requirements are still higher than the average over the life.

Q. Okay. Is there anything else about this spreadsheet or this calculation that you want to convey?

A. I think you covered a lot of it. So that's fine. I think we are fine.

MR. LOQUVAM: Okay. Mr. Albert is available for cross-examination, Your Honor.

ACALJ JIBILIAN: Mr. Patten, do you have any questions?

MR. PATTEN: No questions, Your Honor.

ACALJ JIBILIAN: Mr. Hogan, does Vote Solar have any questions?

MR. HOGAN: No, Your Honor.

ACALJ JIBILIAN: Mr. Rich, for TASC.

MR. RICH: Thank you, Your Honor, just a few, I think.

SUPPLEMENTAL DIRECT TESTIMONY OF CHARLES A. MIESSNER

On Behalf of Arizona Public Service Company

Docket No. E-01345A-16-0036 and E-01345A-16-0123

December 30, 2016

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Attachment CAM-12DR Revised EPR-6S (Clean and Redlined Versions)

SUPPLEMENTAL DIRECT TESTIMONY OF CHARLES A. MIESSNER ON BEHALF OF ARIZONA PUBLIC SERVICE COMPANY (Docket No. E-01345A-16-0036 and E-01345A-16-0123)

I. <u>INTRODUCTION</u>

Q. PLEASE STATE YOUR NAME, ADDRESS, AND OCCUPATION.

A. Charles A. Miessner, 400 North Fifth Street, Phoenix, Arizona 85004. I am Manager of Rates for Arizona Public Service Company (APS or Company).

Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS MATTER?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL DIRECT TESTIMONY IN THIS PROCEEDING?

A. Since the filing of my Direct Testimony, the Commission made a final decision in The Value and Cost of Distributed Generation proceeding, Docket. No. E-00000J-14-0023 (VOS/COS). At page 45 of my original Direct Testimony, I acknowledged that the VOS/COS docket would affect the Company's proposed purchase rates for "export power" produced by DG installations. Attached as CAM-12DR to my Supplemental Direct Testimony is a revised EPR-6S that reflects a calculation of APS's Resource Comparison Proxy (RCP), which is sponsored in the Supplemental Direct Testimony of APS witness Jeffrey Burke.

II. <u>SUMMARY</u>

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Mr. Burke has calculated the Company's RCP to be $ 0.11524. This price should be substituted for the avoided cost figure contained in the original version of EPR-6S. That RCP would be updated annually on each succeeding anniversary of the effective date of EPR-6S.

III. <u>REVISED EPR-6S</u>

Q. WHY REVISE EPR-6S NOW?

A. The avoided cost purchase rate proposed for export power in APS's Application was always intended to be a placeholder should some more definitive means of valuing that power emerge from the VOS/COS proceeding. That has happened with the Commission's adoption of RCP as the base price point. Mr. Burke has made the requisite calculation of that RCP, and the Company believed it was appropriate to provide this information as soon as practical.

Q. HOW WOULD FUTURE ADJUSTMENTS TO THE RCP BE INSTITUTED?

A. APS would submit updated RCP information to Commission Staff at least 45 days prior to the anniversary date of the initial effectiveness of EPR-6S. For example, if EPR-6S becomes effective July 1, 2017 as proposed by the Company, APS would provide updated RCP information no later than May 15 of 2018 and each succeeding year until the Commission determines any alternative means of valuing export power. And per the Commission's recent determination in the VOS/COS proceeding, the RCP purchase rate could not drop more than 10% per year.

Q. WILL A CUSTOMER'S PURCHASE RATE BE STABLE OVER TIME?

A. Yes. At least for the first 10 years of their solar interconnection to the APS grid. While the general purchase rate will be revised each year, each customer's bill credit for excess power will be based on their initial purchase rate, which will continue to apply for 10 years from their interconnection date. After that, their credit will be based on the purchase rate in place at that time and revised annually.

IV. <u>CONCLUSION</u>

Q. DO YOU HAVE ANY FINAL COMMENTS?

A. Only that the Commission should consider the originally-proposed EPR-6S as being withdrawn from any further consideration in this proceeding with the revised version of EPR-6S now representing the Company's proposal concerning exported power from DG facilities less than 100 kW.

Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL DIRECT TESTIMONY?

A. Yes.

RATE RIDER EPR-6S
PARTIAL REQUIREMENTS SERVICE FOR NEW ON-SITE SOLAR DISTRIBUTED GENERATION MODIFIED NET METERING

AVAILABILITY

This rate rider is available to partial requirements Customers with on-site distributed solar generation that is interconnected to the Company's distribution grid and meets all of the following qualifications:

1. Is solar photovoltaic;
2. Is serving a Customer's load;
3. Has a nameplate capacity of 100 kW-ac or less;
4. Has a nameplate capacity less than 125% of the Customer's average monthly kW demand over the prior 12 months (billed demand will be used for Customers served on a demand rate, otherwise metered demand will be used); and
5. Has a nameplate capacity less than the limits for electrical service as follows:
    - 200 Amp service - 12 kW-ac limit
    - 400 Amp service - 24 kW-ac limit
    - 600 Amp service - 37 kW-ac limit
    - 800 Amp service and above - 49 kW-ac limit

The limits for electrical service under section 5 only apply to residential customers. A Customer that qualifies for service under the Company's Legacy Rate Schedules for Net Metering may not participate in this rider.

DESCRIPTION

This rate rider describes how the Company will bill a Customer with qualifying solar generation under the modified net metering program. A partial requirements Customer has on-site generation that serves some of their electrical needs and relies on the Company for additional electrical services. Export energy occurs when the Customer's generation is greater than their electical load in any instant and this excess energy flows back to the Company's grid.

RATE RIDER EPR-6S
PARTIAL REQUIREMENTS SERVICE FOR NEW ON-SITE SOLAR DISTRIBUTED GENERATION MODIFIED NET METERING

PURCHASE RATES

The export energy will be acquired by the Company in exchange for a credit on the Customer's monthly bill, based on the following rate.

$0.11524	per kWh

The purchase rate will be revised annually. However, the Customer's credit will be based on their initial purchase rate, which will continue to apply for 10 years from their interconnection date. After that, their credit will be based on the purchase rate in place at that time and revised annually.

The purchase rate will not be reduced by more than than 10% each year.

SERVICE DETAILS

1. All terms and charges in the Customer's retail rate schedule, other than those specifically included here, continue to apply.

2. Export energy from a distributed solar system is considered to be non-firm becaue it is provided at the Customer's option without any firm guarantee or specific reliance for availability and the energy can be interrupted by the Customer at any time.

3. The Customer must have an Advanced Metering Infrastructure (AMI) meter, or equivalent, installed to measure the production from their solar generation system as well as an AMI meter for electrical service.

4. The Company provides service under this rider in accordance with its Interconnection Requirements, which has provisions that may affect the Customer's bill. Special provisions may also be included in a customer interconnection or purchase agreement.

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PARTIAL REQUIREMENTS SERVICE FOR NEW ON-SITE SOLAR DISTRIBUTED GENERATION MODIFIED NET METERING

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**RATE RIDER EPR-6S
PARTIAL REQUIREMENTS SERVICE FOR
NEW ON-SITE SOLAR DISTRIBUTED GENERATION
MODIFIED NET METERING**

PURCHASE RATES

The export energy will be acquired by the Company in exchange for a credit on the Customer's~~ir~~ monthhly bill, based on the following rate.~~s for summer and winter billing months. Summer months are billing cycles May through October; winter months are billing cycles November through April.~~

~~Summer~~	~~Winter~~	
~~$0.02920~~	~~$0.02867~~	~~per kWh~~

$0.11524	per kWh

The purchase rate will be revised annually. However, the Customer's credit will be based on their initial purchase rate, which will continue to apply for 10 years from their interconnection date. After that, their credit will be based on the purchase rate in place at that time and revised annually.

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